

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The Office Action dated July 27, 2005 has been received and its contents carefully reviewed.

By this Response, claim 1 has been amended, and claim 2 has been cancelled without prejudice or disclaimer. Claims 1 and 3-20 are pending in the application, with claims 11-20 being withdrawn from consideration. Reconsideration and withdrawal of the objection and rejections in view of the above amendments and the following remarks are respectfully requested.

In the Office Action, the disclosure is objected to because of informalities. In particular, the Office Action states the specification does not disclose the features recited in claim 8 of the application. Applicants respectfully disagree and direct the Examiner to, for example, paragraph [0050], lines 4-5 of the originally filed specification, which states “[a]lternatively, the data line 212, the source electrode 214 and the drain electrode 216 may be formed of a single layer of copper (Cu).” Applicants also direct the Examiner’s attention to paragraph [0057], lines 1-3, which states “the data line 212, the source electrode 214, the drain electrode 216 and the storage metal layer 218 can be formed of a single layer of copper (Cu) instead of the Cu/Mo-alloy double layers.” Thus, Applicants respectfully submit no correction is required and request withdrawal of the objection.

In the Office Action, claim 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,468,822, issued to Maeda et al. (hereafter “Maeda”). Applicants respectfully traverse the rejection because Maeda fails to teach or suggest each and every feature recited in the claims of the present application. For example, Maeda fails to teach or suggest an array substrate for use in a liquid crystal display device including, among other features, “a gate electrode and a gate line, each having a molybdenum alloy (Mo-alloy) layer including one of tungsten (W), neodymium (Nd), niobium (Nb) and the combination thereof and a copper (Cu) layer on a substrate, wherein the Mo-alloy layer is formed on the substrate and the Cu layer is formed on the Mo-alloy layer”, as recited in amended, independent claim 1 of the present application.

Maeda discloses a method for manufacturing electro-optic elements; however, Applicants respectfully submit Maeda fails to teach or suggest the above features of amended, independent claim 1. Because Maeda fails to teach or suggest these features of claim 1, claim 1 is not anticipated by Maeda. Reconsideration and withdrawal of the rejection are respectfully requested.

In the Office Action, claims 1, 3, 4 and 6 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,861,368, issued to Chae (hereafter “Chae”). Applicants traverse the rejection because Chae is not valid prior art against the claims of the present application. The present application serial number 10/685,419 claims priority to Korean Application No. 2002-69285, filed November 8, 2002, which antedates the filing date of Chae. To perfect this claim for priority, Applicants file herewith a certified English translation of Korean Application No. 2002-69285. Reconsideration and withdrawal of the rejection are respectfully requested.

In the Office Action, claims 1-10 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Publication No. 20040041958, issued to Hwang et al. (hereafter “Hwang”). Claim 2 has been cancelled without prejudice or disclaimer. Thus, the rejection, as applied to cancelled claim 2, is rendered moot. Applicants traverse the rejection because Hwang is not valid prior art against the claims of the present application. The present application serial number 10/685,419 claims priority to Korean Application No. 2002-0069285, filed November 8, 2002, which antedates the filing date of Hwang. To perfect this claim for priority, Applicants file herewith a certified English translation of Korean Application No. P2002-0069285. Withdrawal of the rejection is respectfully requested.

In the Office Action, claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeda in view of U.S. Patent No. 6,323,490, issued to Ikeda et al. (hereafter “Ikeda”). Claim 2 has been cancelled without prejudice or disclaimer, and its subject matter incorporated into independent claim 1. Applicants respectfully traverse the rejection because neither Maeda nor Ikeda, analyzed alone or in any combination, teaches or suggests the combined features recited in the claims of the present application. In particular, Maeda and Ikeda fail to teach or suggest an array substrate for use in a liquid crystal display device that

includes, among other features, “a gate electrode and a gate line, each having a molybdenum alloy (Mo-alloy) layer including one of tungsten (W), neodymium (Nd), niobium (Nb) and the combination thereof and a copper (Cu) layer on a substrate, wherein the Mo-alloy layer is formed on the substrate and the Cu layer is formed on the Mo-alloy layer”, as recited in amended, independent claim 1.

Ikeda discloses an X-ray semiconductor detector suitable for a medical X-ray diagnostic apparatus (col. 1, lines 4-5). Applicants respectfully note the Examiner’s citation to column 13, lines 52-58. Ikeda discloses metal A47 may be a stacked structure of the identified metals; however, Applicants submit Ikeda fails to teach the features recited in claim 1 of the present application. Specifically, Ikeda fails to teach “a gate electrode and a gate line, each having a molybdenum alloy (Mo-alloy) layer including one of tungsten (W), neodymium (Nd), niobium (Nb) and the combination thereof and a copper (Cu) layer on a substrate, wherein the Mo-alloy layer is formed on the substrate and the Cu layer is formed on the Mo-alloy layer”, as recited in amended, independent claim 1 of the present application.

Because Ikeda fails to teach or suggest these features of claim 1, Ikeda would fail to remedy the deficient teachings of Maeda. Thus, no combination of Maeda and Ikeda would provide an array substrate for use in a liquid crystal display device having the combined features recited in amended, independent claim 1. As such, independent claim 1 is allowable over Maeda and Ikeda. Reconsideration and withdrawal of the rejection are respectfully requested.

In the Office Action, claims 3-7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeda in view of U.S. Patent No. 6,307,602, issued to Song (hereafter “Song”). Applicants respectfully traverse the rejection because neither Maeda nor Song, analyzed alone or in any combination, teaches or suggests the combined features recited in the claims of the present application. In particular, Maeda and Song fail to teach or suggest an array substrate for use in a liquid crystal display device that includes, among other features, “a gate electrode and a gate line, each having a molybdenum alloy (Mo-alloy) layer including one of tungsten (W), neodymium (Nd), niobium (Nb) and the combination thereof and a copper (Cu) layer on a substrate, wherein the Mo-alloy layer is formed on the substrate and the Cu layer is

formed on the Mo-alloy layer”, as recited in amended, independent claim 1 of the present application.

On page 9 of the Office Action, the Examiner concedes that Maeda “fails to disclose the features of claims 3-5. To remedy the deficient teachings of Maeda, the Office Action relies upon the teachings of Song. Based upon the teachings of Song, the Office Action suggests that it would have been obvious to one of ordinary skill in the art to modify Maeda by the teachings of Song to provide a device having the combined features recited in the claims of the present application. Applicants respectfully disagree.

Song discloses a LCD and a method of manufacturing the LCD which is capable of preventing electrical shorts between neighboring pixel electrodes (col. 1, lines 15-19). However, Song fails to teach or suggest “a gate electrode and a gate line, each having a molybdenum alloy (Mo-alloy) layer including one of tungsten (W), neodymium (Nd), niobium (Nb) and the combination thereof and a copper (Cu) layer on a substrate, wherein the Mo-alloy layer is formed on the substrate and the Cu layer is formed on the Mo-alloy layer”, as recited in amended, independent claim 1 of the present application. Because Song fails to teach or suggest this feature, even if the teachings of Maeda and Song were combined, which Applicants do not concede there is proper motivation to do, the resulting device would fail to provide the combined features recited in amended independent claim 1 of the present application.

By virtue of their dependence from independent claim 1, claims 3-7 also contain the above features of claim 1. As such, claim 1 and its dependent claims 3-7 are allowable over any combination of Maeda and Song. Reconsideration and withdrawal of the rejection are respectfully requested.

In the Office Action, claims 9-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeda in view of U.S. Patent No. 6,393,042, issued to Tanaka (hereafter “Tanaka”). Applicants traverse the rejection because neither Maeda nor Tanaka, analyzed alone or in any combination, teaches or suggests the combined features recited in the claims of the present application. In particular, Maeda and Tanaka fail to teach or suggest an array substrate for use in a liquid crystal display device that includes, among other features, “a gate electrode and a gate line, each having a molybdenum alloy (Mo-alloy) layer including one of tungsten

(W), neodymium (Nd), niobium (Nb) and the combination thereof and a copper (Cu) layer on a substrate, wherein the Mo-alloy layer is formed on the substrate and the Cu layer is formed on the Mo-alloy layer”, as recited in amended, independent claim 1 of the present application.

Tanaka discloses “a beam homogenizer which can unify the energy distribution of a linear laser beam in a longitudinal direction” (Abstract). However, Applicants submit Tanaka does not teach or suggest the above features recited in amended, independent claim 1. As such, Tanaka fails to remedy the deficient teachings of Maeda, and no combination of Maeda and Tanaka would provide the combined features of the device recited in independent claim 1 of the present application.

By virtue of their dependence from independent claim 1, claims 9-10 also contain the allowable features of claim 1. Thus, claim 1 and its dependent claims 9-10 are allowable over any combination of Maeda and Tanaka. Reconsideration and withdrawal of the rejection are respectfully requested.

Applicants believe the foregoing amendments and arguments place the application in condition for allowance and early, favorable action is respectfully solicited.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

Application No.: 10/685,419
Amendment dated October 27, 2005
Reply to Office Action dated July 27, 2005

Docket No.: 8733.874.00

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

Dated: October 27, 2005

Respectfully submitted,

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